

# INTERDISCIPLINARY GRANTS IN THE MATHEMATICAL SCIENCES (IGMS)

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## *Program Solicitation*

**NSF 01-115 (replaces NSF 99-157)**

**DIRECTORATE FOR MATHEMATICAL AND PHYSICAL SCIENCES  
DIVISION OF MATHEMATICAL SCIENCES**

**FULL PROPOSAL DEADLINE(S) :**

**November 26, 2001      and the 4th Monday of November of each subsequent year,  
until cancelled.**



**NATIONAL SCIENCE FOUNDATION**



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# SUMMARY OF PROGRAM REQUIREMENTS

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## GENERAL INFORMATION

**Program Title:** INTERDISCIPLINARY GRANTS IN THE MATHEMATICAL SCIENCES (IGMS)

### Synopsis of Program:

The objective of the Interdisciplinary Grants in the Mathematical Sciences (IGMS) is to enable mathematical scientists to undertake research and study in another discipline so as to:

- expand their skills and knowledge in areas other than the mathematical sciences;
- subsequently apply this knowledge in their research, and
- enrich the educational experiences and broaden the career options of their students.

Recipients of an IGMS award are expected to spend eleven months full time in a twelve-month period either in a non-mathematical academic science department or in an industrial, commercial or financial institution. The expected outcome is sufficient familiarity with another discipline so as to open opportunities for effective collaboration by the mathematical scientist with researchers in another discipline.

These awards are in addition to those available in the Grant Opportunities for Academic Liaison with Industry (GOALI) activity. For further details on GOALI, see NSF 98-142, or subsequent publication.

### Cognizant Program Officer(s):

- Lloyd Douglas, Program Officer, Division of Mathematical Sciences, Room 1025, telephone: (703) 292-4862, e-mail: [ldouglas@nsf.gov](mailto:ldouglas@nsf.gov).

### Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.049 --- Mathematical and Physical Sciences

## ELIGIBILITY INFORMATION

- **Organization Limit:** Proposals may be submitted by academic institutions in support of individual investigators.
- **PI Eligibility Limit:** To be eligible for these awards, the PI must hold a tenured or tenure-track position at the academic institution submitting the proposal and have a strong background in one of the disciplines within the purview of the Division of Mathematical Sciences.

- **Limit on Number of Proposals:** None

## **AWARD INFORMATION**

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** Approximately 10 awards per year
- **Anticipated Funding Amount:** Up to \$1 million will be available for this activity each year, subject to the availability of funds.

## **PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

### ***A. Proposal Preparation Instructions***

- **Full Proposals:** Supplemental Preparation Guidelines
  - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

### ***B. Budgetary Information***

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

### ***C. Deadline/Target Dates***

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):**

November 26, 2001                      and the 4th Monday of November of each subsequent year, until cancelled.

### ***D. FastLane Requirements***

- **FastLane Submission:** Required
- **FastLane Contact(s):**
  - LaVern Friels, telephone: (703) 292-4854, e-mail: [dmsfl@nsf.gov](mailto:dmsfl@nsf.gov).

## **PROPOSAL REVIEW INFORMATION**

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

## **AWARD ADMINISTRATION INFORMATION**

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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## **I. INTRODUCTION**

The objective of the Interdisciplinary Grants in the Mathematical Sciences (IGMS) is to enable mathematical scientists to undertake research and study in another discipline so as to"

- expand their skills and knowledge in areas other than the mathematical sciences;
- subsequently apply this knowledge in their research, and
- enrich the educational experiences and broaden the career options of their students.

Recipients of an IGMS award are expected to spend eleven months full time in a twelve-month period either in a non-mathematical academic science department or in an industrial, commercial or financial institution. The expected outcome is sufficient familiarity with another discipline so as to open opportunities for effective collaboration by the mathematical scientist with researchers in another discipline.

These awards are in addition to those available in the Grant Opportunities for Academic Liaison with Industry (GOALI) activity. For further details on GOALI, see NSF 98-142, or subsequent document.

## **II. PROGRAM DESCRIPTION**

### **Proposal Content**

It is expected that the recipients will immerse themselves in a discipline apart from the mathematical sciences that makes use of the mathematical sciences in a significant way. Hence, the recipient should reside in a department or laboratory other than the mathematical sciences for the duration of the award. NSF expects that the recipients will remain in academia for a minimum of one year following the end of the grant.

### **Required Commitments**

- To help ensure institutional support of these interdisciplinary activities, there should be a co-PI at the level of dean (or higher level university official) at the submitting institution. A brief description from the latter of the expected impact of these activities on the institution's research and education efforts, as well as a statement of expected duties while on assignment to the host department, must be included in the proposal.
- The proposal must also include a statement of commitment from the host institution or department which contains at a minimum: (a) commitment for an office as well as laboratory space, if appropriate, in the host department, for the award duration; (b) assurance that the investigator will be treated as a regular faculty member within the host unit, and be granted authority to conduct the activities in accordance with their best judgment, consistent with the organization's policies; (c) identification of at least one

senior person in the host organization who will serve as host to the award; and (d) approval by a department head or above at the host organization.

These items may be included as Supplementary Documentation in Section I of the proposal or in the Project Description, but not as an Appendix.

### **III. ELIGIBILITY INFORMATION**

Proposals may be submitted by academic institutions in support of individual investigators.

### **IV. AWARD INFORMATION**

The duration of the award will be for a twelve month period. It is expected that up to 10 awards will be made depending on the quality of the proposals submitted and the availability of funding. The total grant will not exceed \$100,000 per award. Requests of additional amounts for equipment may be considered. The need for such equipment must be well documented in the proposal. Other allowable costs can be found in Chapter VI of the NSF Grant Proposal Manual (NSF 95-26, or subsequent version).

DMS is very interested in fostering significant new projects that build on IGMS projects. Previous IGMS grantees are invited to explore the possibility of submitting a proposal to the Small Grants for Exploratory Research (SGER) program by discussing it with the appropriate program officer in the Division of Mathematical Sciences following their IGMS grants. Information on SGER awards can be found in the NSF Grant Proposal Guide.

### **V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

#### **A. Proposal Preparation Instructions**

##### **Full Proposal:**

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?nsf012>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

The proposal must include:

- a well-defined description of the proposed activity and a corresponding implementation plan;

- a statement delineating the PI's expectation of the impact of this experience on the PI's subsequent research and education activities;
- an approximate time schedule for accomplishing the proposed activities;
- a plan for applying the newly acquired expertise to broaden the research and educational experiences and career options for students;
- an evaluation phase including plans and metrics to be used to assess the success of the project; and
- a dissemination plan, to share the outcome(s) with the community.
- To help ensure institutional support of these interdisciplinary activities, there should be a co-PI at the level of dean (or higher level university official) at the submitting institution. A brief description from the latter of the expected impact of these activities on the institution's research and education efforts, as well as a statement of expected duties while on assignment to the host department, must be included in the proposal.

Proposers are reminded to identify the program solicitation number (NSF 01-115) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

### **B. Budgetary Information**

Cost sharing is not required in proposals submitted under this Program Solicitation.

### **C. Deadline/Target Dates**

Proposals must be submitted by the following date(s):

#### **Full Proposals by 5:00 PM local time:**

November 26, 2001            and the 4th Monday of November of each subsequent year, until cancelled.

### **D. FastLane Requirements**

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

*Submission of Signed Cover Sheets.* The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see [Chapter II, Section C](#) of the Grant Proposal Guide for a listing of the certifications). The AOR

must provide the required certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: <http://www.fastlane.nsf.gov>.

## **VI. PROPOSAL REVIEW INFORMATION**

### **A. NSF Proposal Review Process**

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

#### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

### ***Integration of Research and Education***

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

### ***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

### **Additional Review Criteria**

In addition to the National Science Board merit review criteria, reviewers will be asked to apply several equally-weighted activity specific criteria when reviewing IGMS proposals. These criteria are:

- (1) Competence: The quality of independent research and accomplishment of the PI in his or her own area.
- (2) Movement: The degree of movement by the PI beyond his or her own areas of expertise. Bolder moves will be favored over minor, incremental changes or additions.
- (3) Consequence: The degree of expected impact of the grant activity on the PI's own research, as well as on the development of students in both disciplines involved.

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

### **B. Review Protocol and Associated Customer Service Standard**

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Mail and/or panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

## **VII. AWARD ADMINISTRATION INFORMATION**

### **A. Notification of the Award**

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

### **B. Award Conditions**

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)\* or Federal Demonstration Partnership (FDP) Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

\*These documents may be accessed electronically on NSF's Web site at [http://www.nsf.gov/home/grants/grants\\_gac.htm](http://www.nsf.gov/home/grants/grants_gac.htm). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

### **C. Reporting Requirements**

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

## **VIII. CONTACTS FOR ADDITIONAL INFORMATION**

General inquiries regarding INTERDISCIPLINARY GRANTS IN THE MATHEMATICAL SCIENCES should be made to:

- Lloyd Douglas, Program Officer, Division of Mathematical Sciences, Room 1025, telephone: (703) 292-4862, e-mail: [ldouglas@nsf.gov](mailto:ldouglas@nsf.gov).

For questions related to the use of FastLane, contact:

- LaVern Friels, telephone: (703) 292-4854, e-mail: [dmsfl@nsf.gov](mailto:dmsfl@nsf.gov).

## **IX. OTHER PROGRAMS OF INTEREST**

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](#) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

## **ABOUT THE NATIONAL SCIENCE FOUNDATION**

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at [plainlanguage@nsf.gov](mailto:plainlanguage@nsf.gov).

## **PRIVACY ACT AND PUBLIC BURDEN STATEMENTS**

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants

as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

*OMB control number:* 3145-0058.